

December 24, 1960

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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Oddly Monster

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A SCIENCE SERVICE PUBLICATION

MEDICINE

May Cause Nerve Disease

► **ABRUPT REDUCTION** or withdrawal of cortisone and other steroids used to treat rheumatoid arthritis has been linked to a nerve disease, peripheral neuropathy, that frequently accompanies arthritis.

A study involving all rheumatoid arthritis patients seen within the last 15 years at the Mayo Clinic, Rochester, Minn., showed the link. Drs. Richard H. Ferguson and Charles H. Slocumb reported to the American Rheumatism Association meeting in Dallas, Tex.

Peripheral neuropathy may cause damage to nerves in different parts of the body, particularly the arms, hands, legs and feet. Damage may spread over a wide area, with loss of sensation, muscle weakness and consequent loss of movement. The pain may be so severe that narcotics have to be given.

A type of peripheral neuropathy called polyneuropathy, which affects several nerves, was found in 61 patients treated at the Mayo Clinic during the period 1950-60, when steroids had come into use. The

majority had been treated with heavy doses of steroids and showed marked signs of hypercortisonism, including stomach ulcers, weight gain and brittle bones.

No examples of polyneuropathy were found in 5,188 rheumatoid arthritis patients examined during the five-year period 1945-49, before steroids were used. The scientists said it has been only within the past few years that increasing attention has been paid to peripheral neuropathy in arthritic patients.

Another process of peripheral neuropathy, which is called mononeuritis multiplex, attacks only single nerves in various parts of the body. It is linked with severe inflammation of the arteries, intensified by steroid treatment.

Abrupt discontinuance or reduction of steroid intake affects both types of peripheral neuropathy. Gradual tapering to safe maintenance doses is essential if the patient is to be rehabilitated, the physicians said.

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MEDICINE

Body's Role in Cancer

► **A PERSON'S PHYSICAL** condition plays a prominent if not decisive role in the development of cancer, Dr. Harry Rubin of the University of California's virus laboratory at Berkeley, Calif., reported.

Maintaining the host's natural resistance to cancer may prove more practical than trying to protect him from cancer viruses or cancer-causing chemicals, the findings suggest.

In studies of the behavior of Rous sarcoma virus, which causes cancer in chickens, Dr. Rubin discovered that cells can remain healthy even in the presence of multiplying viruses if the environment contains natural substances that allow the cells to function at their best.

Dr. Rubin used laboratory dishes as a substitute for the body. In these he placed normal living cells along with viruses that could make the cells cancerous and fresh calf or fetal calf blood at various concentrations to nourish the cells.

Something in the fresh blood when present in high enough concentrations halted the effects of the virus. Even though the viruses continued to multiply, they did not alter the cells as they do in cancer. Fetal calf blood was more powerful in preventing the cancer changes than the blood of growing calves.

Dr. Rubin has isolated one of the active substances from the sera—a protein called fetuin. Other protective substances also may be involved. He believes the fetuin acts directly on normal cells, enabling them to grow rapidly and produce materials that block the cancerous transformation of the infected cells.

However, if great numbers of viruses

dumped into the cultures overwhelm the defenses even in the presence of high serum concentrations, they can cause cancerous changes.

Something similar may occur in chickens infected with the virus. If the virus is given in low doses it may cause no cancer or a cancer that regresses spontaneously. If it is given in high dose to the embryo, it brings on a bleeding disease instead of a cancer.

Dr. Rubin says a parallel exists in other cancers. Mice infected with a virus leukemia

PUBLIC HEALTH

Fountain of Death

► **POLLUTION OF OUR** water systems may cause the death of our civilization, Sen. Robert S. Kerr (D-Okla.) warned.

"This fountain of death," the Senator told SCIENCE SERVICE, "has become a serious threat to our way of life and is a major hazard to the national health as well as a major cause of the destruction of our fish and wild life."

Just to bring the sewage systems of United States municipalities to an acceptable standard will cost about \$600 million a year for eight years. This expenditure will not include cleansing our streams, rivers and waterways that growing industries and the accompanying dumping of their industrial wastes have polluted and are continuing to pollute, he said, at an informal meeting with public officials and leaders of private groups concerned with water conservation.

or other cancer viruses before or at birth do not usually show the disease for a long time. Presumably, age brings on the physiological conditions that enable the viruses to cause cancer.

The American Cancer Society, which supported Dr. Rubin's experiments, announced his findings.

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MEDICINE

Hope Seen for Victims Of Lupus Erythematosus

► **FAVORABLE PROSPECTS** for victims of lupus erythematosus, a usually fatal disease of the connective tissues, were reported after a study of 72 cases surviving three years.

Dr. Robert P. McCombs, Tufts University School of Medicine, Boston, Mass., told the Hahnemann Medical College and Hospital symposium on inflammation and diseases of connective tissues in Philadelphia that there was hope for victims when the severity of the disease did not progress during the first three years after it began.

The prognosis was favorable, he said, provided there was no kidney involvement, blood abnormality, skin or constitutional manifestations at the time of diagnosis.

Dr. McCombs said corticosteroids aided in prolonging life to 36 months from the time of diagnosis in nearly all cases except those with kidney involvement. Even in such cases survival was enhanced by their use.

The prolonged use of corticosteroids, which are compounds isolated from the adrenal cortex, carried some risks, Dr. McCombs said, but in all but mild cases the risks were justified. Complications of this treatment constituted the second most common cause of death.

The 72 cases of survival follow-up were among 104 cases of lupus erythematosus seen by Dr. McCombs at the New England Center Hospital, Boston.

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Sen. Kerr, chairman of the Senate's select committee on national water resources, considers the reclaiming of our water "a direct challenge to the democratic system."

He noted that Soviet Premier Nikita Khrushchev has said that such major reforms cannot be done under a capitalist, democratic system.

Unless we want to imitate totalitarian control, with Federal Government undertaking the job on a total national level that would affect regulation of state industries and other matters now handled independently, municipal and state governments must initiate and undertake major responsibility for keeping their water fit to drink, the Senator said.

He endorsed the view of Federal responsibility in this area suggested by U.S. Surgeon General Leroy E. Burney.

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PUBLIC HEALTH

Nation's Polluted Waters

The dangerous pollutants of the nation's waters include sewage, chemicals that kill microbes but may be toxic to humans, ionizing radiation, and lead from agricultural sprays.

► THE NATION'S polluted waters are "a disgrace," Surgeon General Leroy E. Burney told delegates at the first National Conference on Water Pollution in Washington, D. C.

Dangerous pollutants cited by Dr. Burney include sewage, chemicals that kill microbes but may be toxic to humans or fish, ionizing radiations, lead from agricultural sprays and auto exhausts.

The Federal Government has been concerned about dirty water since 1913, Dr. Burney said. Today its main research center, The Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio, has teams of experts working on freeing water supplies from viruses and bacteria, detergents, insecticides and radioactive contaminants.

They also have developed a pilot sewage treatment procedure suitable for housing subdivisions beyond reach of city sewer systems.

The Public Health Service, Dr. Burney said, has 75 stations where interstate waters are sampled. PHS also keeps tabs on how many facilities are dirtying the water, how many are cleaning it up and how much it is costing the taxpayer.

When pollution in one state endangers another, the Surgeon General and the Secretary of Health, Education and Welfare can take action to abate pollution. Thirteen enforcement actions have been taken, and only one case, in St. Joseph, Mo., has required Federal court action.

In calling for cooperation, Dr. Burney said, "the most fundamental responsibility of all rests at the source—with the municipalities and industries concerned. Clearly too, the states must continue to be key-

stones of our pollution control efforts. Historically, legislatively and logically the strength of the state agency is a major determinant of success in pollution abatement."

Among the questions which faced the Conference were those of what type research is most pressing; how much money it will take; and where the money will come from.

Also before the conference were such questions as what new tests will tell whether water in a stream is safe; what should be the national policy on the utilization of streams for waste disposal; how much should be spent on pollution control, as apart from research; what proportions should be paid by state, local and Federal governments; how these costs compare with the costs of neglect; and finally, who will pilot the program and who will enforce the agreements when responsibilities are not met.

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Natural Pollutants

► NATURAL POLLUTION, mainly from dirt and salts, contaminates the nation's streams, but is getting less attention than man-made pollutants.

Dr. Dwight F. Metzler, chief engineer of the Kansas State Board of Health, told the National Conference on Water Pollution, in Washington, D. C., that long before cultivation accelerated the siltation rate, early settlers said that the Missouri River was "too thick to navigate and too thin to cultivate."

Despite heavy organic pollution, the Potomac River's most serious pollution

problem is silt. Its annual silt load may be as much as 40,000,000 cubic feet.

The nation's longest stream, the "lazy" Mississippi, has a sediment yield of 500,000,000 tons per year. Perhaps 50% to 75% of this erosion can be stopped, but the cost would be about \$6 billion, and problems with aquatic plant life might make the cure, desilting, worse than the disease.

Another natural pollution problem is the leeching of natural salts. In the Arkansas and Red River valleys, dissolving of natural beds of sodium chloride and gypsum have made waters hard, disagreeable to taste and disruptive to the digestive system.

Dallas residents bought drinking water in milk cartons rather than use the city supply during its 1955-56 water shortage. Cooperative Public Health Service studies have shown that 1,600 tons per day of common salt are pouring into the Red River and even larger amounts enter the Arkansas River.

Adding to the problem is the irrigation water that seeps back into the streams, carrying with it soluble minerals dissolved from the land. Some local studies are being made but, so far, no country-wide evaluation has been made of this problem.

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PSYCHIATRY

Childhood Saying Called Important in Life

► "STICKS AND STONES may break my bones but names will never hurt me." So chants the small boy who has become the unfortunate object of ridicule by his playmates.

This distinction is important in life; it is essential to self-preservation, Dr. Peter A. Martin of Wayne State University Medical School of Detroit told the American Psychoanalytic Association in New York.

He described some of his mental patients who had failed to learn it. These patients were not able to admit fear even when they were in terrible peril because to recognize the danger would be to cause fear. And such fear would cause a loss of other people's love.

To them, names do break their bones. When threatened with criticism or loss of love, they experience the type of anxiety other people have when faced with danger to life and limb.

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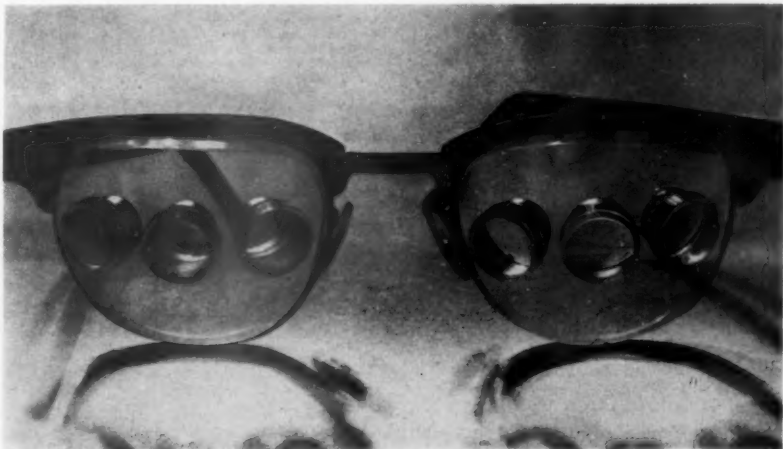
OPTICS

New Vision to Near Blind From Telescopic Lenses

► AN INDIRECT BENEFIT from space research is a device by which the partially or near blind may increase their vision by up to 300 percent.

Dr. William Feinbloom of New York applied the principle of alternating panoramic fixation used in the satellite camera and lens system to a multi-directional "space lens." Three tiny telescopic lenses in each spectacle give a total directional field of 100 degrees.

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"SPACE LENSES" FOR THE PARTIALLY BLIND

DERMATOLOGY

Skin Disorders Helped

► **HYPNOSIS INTELLIGENTLY** used on intelligent subjects is effective in skin disorders, Dr. Michael J. Scott of the University of Washington, Seattle, told the American Academy of Dermatology and Syphilology meeting in Chicago.

This is true not only in emotionally caused but in organically based skin diseases and some allergies, Dr. Scott said. Eczema, psoriasis, hives, warts and shingles were among the disorders he included.

But he emphasized that overenthusiastic extremists claim magical results blown up out of all proportion to reality, while opponents of hypnotherapy stress rare complications and harmful side effects.

"Such widely publicized views of a minute minority of hypnotherapists," he said, "are performing a disservice not only to the scientific researcher but to the public as well and retard the proper utilization of this valuable adjunct to medical therapy."

Dr. Scott said if hypnosis is properly

used in wisely selected skin patients, it is one of the safest methods of treatment available. He warned that physicians using hypnosis should have a basic knowledge of psychology. Without this, he said, it is a flimsy and potentially dangerous tool.

During hypnotic trance a physician can replace an undesirable habit with a constructive one.

"A person who lets an irritating wife or boss 'get under his skin' and cause him to itch and scratch," Dr. Scott pointed out, "can through hypnotic suggestion replace scratching by hitting a punching bag to release this harbored resentment."

Hypnosis may also enable a physician to discover subconscious conflicts that show themselves in skin disturbances. Repressed fear, hate, love, frustration, anger and so on can be consciously forgotten but subconsciously cause trouble, the speaker said.

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DERMATOLOGY

Acne Treatment Found

► **AN EXPERIMENT** with a new drug successful in treating the teen-age scourge of acne was reported at the American Academy of Dermatology and Syphilology meeting in Chicago. The antibiotic is Declomycin, a trade name for a 7-Chloro-6-demethyltetracycline.

Dr. John H. Hicks of the University of Miami School of Medicine, Miami, Fla., reported that of 30 patients receiving the drug, 83% showed good to excellent response. His experiment was in the form of a "double-blind" study in which a placebo was given to 16, but neither the patient nor the physician knew what medication the patient was getting until the test was completed.

Twelve of the patients developed a sun-light allergy from Declomycin, but by

avoiding exposure to the sun, they were able to continue medication.

Another skin disease, psoriasis, was discussed by Dr. Rees B. Rees of the University of California's School of Medicine in San Francisco, who said it may be a delayed physiologic birthmark.

"An inborn predisposition," he said, "persists even after the scaly areas are brought completely or partially under control."

The drugs aminopterin and methotrexate slow down the cell reproduction when the outer layers of the skin race out of control, he said, but these drugs are subject to rigid Federal Food and Drug Administration control and must be given directly to the patient by the doctor.

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DERMATOLOGY

Chemical Bleaches Skin

► **CONTINUED GOOD RESULTS** from a chemical that can turn Negro patients white who have vitiligo, or piebald skin, were announced by Dr. Robert Stolar, a Georgetown University clinical associate in dermatology, Washington, D. C., told the American Medical Association in Washington, D. C. He introduced a Negro woman, who turned completely white after a three-year treatment.

The chemical is "a purified and finely milled monobenzyl ether of hydroquinone" made into an ointment by Drs. Aaron Bunsen Lerner and Thomas B. Fitzpatrick

of Portland, Ore., see SNL, 63:390, June 27, 1953.

In 1953 the chemical was used mainly for liver spots, severe freckles, the darkened skin of Addison's disease and berlock, or berlock dermatitis, a discoloration of the skin that sometimes follows the use of perfumes or toilet articles that contain ethereal oil.

The doctors said two Negro patients had used the ointment on a single arm for long periods of time and that they became entirely depigmented except for the hair and eyes, which kept their normal coloring.

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DERMATOLOGY

Friendly Cats May Carry Cat Scratch Disease

► **CATS MAY** innocently infect their owners with cat scratch disease without ever baring their claws.

The cause of this skin disease may be a filtrable virus, Dr. Ray O. Noojin of the University of Alabama medical center, Birmingham, told the American Academy of Dermatology and Syphilology in Chicago.

Dr. Noojin said many persons break out with the disease after merely coming into contact with a cat without actually being scratched. The disease tends to develop in two weeks after the patient has noted a cat scratch or at least been in contact with a cat.

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AERONAUTICS

Safer to Fly Backwards

► AIRLINE PASSENGERS should be flying backwards for "safety-first" reasons, Col. John Paul Stapp of the Aerospace Medical Center, Brooks Air Force Base, Texas, told SCIENCE SERVICE.

Experiments under Col. Stapp's direction by the Air Force since 1948 "have demonstrated conclusively that seats facing backwards are the best and safest position for air transport passage," he said. His tests also show that survival chances in the event of a crash landing would be increased if planes had attachments and seat strength 25 times the force of gravity.

Similar findings were independently made and acted on by the British, he said.

Between 1953 and 1957 there were seven crashes of British military and commercial transports, in which 259 backward-facing passengers were involved. The crashes ranged in intensity from destruction of the forward-facing pilot compartment with death of crew to virtual disintegration of the aircraft.

Only three passengers in the seven accidents were killed and 12 injured, Col. Stapp said.

The jet age has not improved the situation. Sixty-two forward-riding passengers

were killed in the Electra jet crash at Logan airport on Oct. 4, with only 10 survivors.

Most military air transports now have backward-facing seats. Government planes reserved for executive travel, however, including the President's plane, the Columbine, have not yet been modified in accordance with Air Force safety recommendations.

Federal Aviation Agency engineers are working on a new and stronger seat design better suited for the hazards of a jet crash.

The tragedy of the recent Electra crash at Boston may result in general acceptance of seating arrangements and design recommended by Col. Stapp more than a decade ago.

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AERONAUTICS

British Are Now Choosing Astronauts

► THE BRITISH are selecting astronauts for their own man in space program.

The Parliament has authorized 140,000,000 pounds sterling (about \$384,

200,000) to put an Englishman into space.

The program already is under way, but no information is available yet on how many astronauts will be chosen or what the British have in the way of plans for their manned space venture.

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AERONAUTICS

Manned Spaceship Faults Can Be Noted on Earth

► IF A MANNED SPACESHIP should suddenly start to sputter while in flight, an earth-based robot "mechanic" could diagnose the trouble and recommend repair procedures.

Such a system would be entirely practical and feasible, Halim Ozkaptan, research psychologist at Republic Aviation Corporation, told the Third Electronic Industries Association Conference meeting in San Antonio, Tex.

The robot service station plan calls for the establishment of maintenance centers built around electronic computers that would be fed all data relating to the operation of the spaceship. Here is how it would work:

Something goes wrong with the spaceship, and the astronaut cannot make a forced landing or send for a repair man. He relays to the computer, via code, voice, printed instructions or video, information about the difficulty and the symptoms.

The computer runs trial solutions to diagnose the defect. If it spots the trouble, it recommends steps to fix the trouble. If more facts are needed, it asks for them. If the diagnosis is critical, it issues a "May Day" warning, indicating that emergency measures be taken.

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AERONAUTICS

New Training Aid for Jet Pilots Developed

► FIGHTER AND BOMBER pilots of the jet age can now learn to fly at low altitudes over dangerous mountains and other hazardous ground features without leaving the ground.

A new simulator, developed by the electronics division of ACF Industries, Incorporated, Riverdale, Md., is patterned after the North American Search and Ranging Radar. NASARR is said to be the most accurate system for detecting ground hazards and target complexes from a moving aircraft.

NASARR is supposedly able to detect ground objects from a plane flying at low altitudes, whereas previous systems were inaccurate at such low levels.

The new radar simulator makes it possible to train pilots and crew under actual flight conditions without the problems met using actual equipment. The low-altitude training requirement is now necessary because increasingly effective enemy air defense techniques have forced jet fighters and bombers to approach targets at low altitudes.

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PILOT TRAINING WITH MAP, TV CAMERA AND RADAR SCOPE

BACTERIOLOGY

Deadly Bacterium in Silage

► THE DEADLY bacterium *Listeria monocytogenes* has been isolated from oat silage by a Montana researcher. This backs up findings in Iceland where the relationship is so striking that listeriosis is known as silage sickness.

For 20 years, puzzlement as to the ultimate source of listeriosis infections has plagued veterinary and medical researchers. In cattle and sheep the listeria organism is held responsible for abortions. In man it is linked with purulent meningitis and an infectious mononucleosis-like syndrome.

The present evidence of a link between silage and listeriosis came to light when 16 sheep showed signs of listeric encephalitis one week after the entire flock of 900 had eaten oat silage. Several of the sheep died and *L. monocytogenes* was isolated from the autopsied brain of one.

Dr. M. L. Gray of Montana State College's Veterinary Research Laboratory in

Bozeman, Mont., fed portions of the silage to mice. All the mice died within 14 days, but the listeria organism was not found in any of them.

However, when a silage-water solution was injected into 35 mice, the bacterium was found in each of the 32 that died, and in the three that retained a healthy appearance.

These findings suggest, Dr. Gray reported in *Science*, 132:1767, 1960, that silage-fed animals may contract listeriosis by inhaling the organism rather than by eating the silage.

As yet no one has found out how the bacterium gets into the silage. It is possible, Dr. Gray suggests, that *L. monocytogenes* is a soil bacterium or even a common inhabitant of some plant life. The silage also could be contaminated by ground game or birds, known to be potential carriers.

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DRS. HARUAKI YAJIMA AND KLAUS HOFMANN CHECK ACTH

BIOCHEMISTRY

ACTH: 100 Percent Active

► THE FIRST SUCCESSFUL synthesis of ACTH, a hormone used to treat arthritis, was reported by University of Pittsburgh scientists after a seven-year study.

The new man-made hormone, which has all the properties of natural ACTH, is the largest protein-like molecule yet reproduced in the laboratory.

Dr. C. H. Li of the University of California reported in November that he had synthesized a 19-unit molecule with 20% to 25% the activity of natural ACTH in a highly purified sample. The Pittsburgh biochemists have obtained 100% biological ac-

tivity with a molecule containing 23 amino acids.

The tedious chemical procedures used by the scientists are paving the way for synthesizing even more complex protein-like molecules. Their research is expected to help clarify the functions of the pea-sized pituitary gland.

The laboratory synthesis will allow scientists to work with pure ACTH. This could lead to an understanding of how the pituitary gland at the base of the brain, where ACTH is produced naturally, stimulates the adrenal gland's cortex to produce

cortisone and other important steroid hormones. The techniques developed can now be used to modify the natural structure of ACTH in hopes of achieving medically important results.

Members of the Pittsburgh group, led by Dr. Klaus Hofmann, chairman of the biochemistry department, include Dr. Haruaki Yajima, Dr. and Mrs. Noboru Yanai-hara, Teh-Yung Liu, Saul Lande and John L. Humes.

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GENERAL SCIENCE

Increased Employment of Scientists and Engineers

► EMPLOYMENT of scientists and engineers rose nearly seven percent during 1959, a two percent increase in growth from the previous year.

The National Science Foundation reported in Washington that more than 800,000 scientists and engineers were employed in United States business firms in January, 1960. The figures were compiled for the Foundation from a survey conducted by the Bureau of Labor Statistics of the U. S. Department of Labor. The data will be used to help the Foundation develop programs for strengthening the country's scientific manpower resources.

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GENETICS

Chromosome Mosaicism Found in Hermaphrodite

► THE FIRST demonstration of mosaicism in a true hermaphrodite, an individual possessing both male and female characteristics, was reported in the *New England Journal of Medicine*, 263:1044, 1960. Mosaicism is the appearance of genetically different tissues in the same individual.

Drs. Kurt Hirschhorn, Wayne H. Decker and Herbert L. Cooper of New York University described a hitherto unreported type of mosaicism in which an infant's bone-marrow cells showed a mixture of XY and XO sex-chromosome constitution.

The body cells have an XX sex-chromosome constitution in females, whereas in males, they have an XY chromosome constitution. The XO configuration occurs when the body cells have only a single sex chromosome instead of the usual pair.

The scientists said the mosaicism is probably due to the accidental loss of the Y chromosome during a stage of cell division called anaphase. This would result, they said, in a normal XY cell and an XO cell, both of which might continue to develop, forming parts of the resultant individual.

If the loss of the Y chromosome occurred at the very first division of the zygote (fertilized egg), they said one would expect at most 50% of the individual to consist of abnormal cells.

In the case of the hermaphrodite, plastic surgery is planned for the future, at which time genital tissue will be obtained for more enlightening chromosomal analysis.

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PHYSICS

Element 98 Prepared

The first pure compound of the man-made element californium has been prepared by University of California scientists with samples weighing about ten-millionth of a gram.

► THE FIRST PURE compounds of the man-made element californium, No. 98, have been prepared by scientists at the Lawrence Radiation Laboratory of the University of California, Berkeley, where this element was first made.

Preparation and identification of the compounds was carried out by Drs. Burris B. Cunningham and James C. Wallmann. Three separate californium compounds—californium trichloride, californium oxychloride and californium oxide—were prepared by treatment of the element with hydrochloric acid and steam at high temperatures.

Dr. Glenn T. Seaborg, Nobel Prize-winning chancellor of the University of California at Berkeley, described the work in a distinguished lecturer's address at the winter meeting of the American Nuclear Society.

Dr. Seaborg said the feat of carrying out identifiable chemical reactions with such minute quantities of material—samples weighing about a ten-millionth of a gram—was accomplished as a result of the recent perfection, by Dr. Cunningham and his colleagues, of techniques for working on the "submicrogram" scale.

Californium is one of the "dinosaurs" of matter—an element that may have been present in the beginnings of the earth but soon disappeared through radioactive decay. The element was first fabricated with the use of the atom smashers by University of California scientists.

Dr. Seaborg also stated that a neutron irradiation program now in progress at the Materials Testing Reactor at Arco, Idaho, will yield about a ten-millionth of a gram of einsteinium (element 99) early next year. This quantity, he said, might be enough to permit the isolation of einsteinium for the first time.

Einsteinium is likely to be the only remaining transuranium element that can be isolated in visible amounts, because of the increasingly short lifetimes of the heaviest synthetic elements. Visible quantities of berkelium and californium (elements 97 and 98) were first isolated two years ago by Dr. Cunningham and Dr. Stanley G. Thompson at the Lawrence Radiation Laboratory.

Although elements beyond the presently known 102 will undoubtedly be discovered, Dr. Seaborg said, it should be possible to produce and detect not more than an additional half dozen or so.

The best chance of success, he said, lies in the firing of heavy ions into targets of high atomic number. The small number of atoms of new elements produced, coupled with their extremely rapid decay, will soon require development of new methods of identification.

Dr. Seaborg predicted that the longest-lived isotope of element 104, for example, will have a half-life of only a few minutes or less. With element 106, this will be reduced to but a few seconds or less, and no isotope of element 108 is likely to have a half-life of more than a tenth of a second.

Dr. Seaborg also described the current research efforts of Dr. Albert Ghiorso and his co-workers to discover element 103 in the heavy ion linear accelerator at the Lawrence Radiation Laboratory.

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PURE CALIFORNIUM

PHYSICS

Gas Centrifuge Plant for Uranium Easily Hidden

► A GAS CENTRIFUGE plant to produce high-grade uranium-235 for atomic weapons could be easily hidden by any nation desiring to do so, the chairman of the U. S. Atomic Energy Commission, John A. McCone, reported.

He said that practical use of the gas centrifuge method for producing weapons is "several years away," although the process will ultimately prove useful. The problems still to be solved will be solved in time, Mr. McCone predicted.

The gas centrifuge process will not be simple or cheap. Thousands of machines would be needed to produce uranium-235

for weapons. Each, with auxiliary equipment, might cost several thousand dollars.

Scientifically and industrially advanced countries would require several years, perhaps eight, to perfect the gas centrifuge method to the point where it could produce enough material for a nuclear weapon, Mr. McCone reported. Less industrialized countries would need a much longer period, depending on how much outside assistance they received from more advanced nations.

Mr. McCone predicted that perfection of the gas centrifuge process would introduce "an additional complicating factor in the problems of nuclear arms among nations and our quest for controlled disarmament." The production plant could be simply housed. Its power requirements would be relatively small, and there would be no effects of the operation that would easily disclose the plant.

The AEC also proposed to allow private industry to work, under security wraps, on development of the gas centrifuge method.

The gas centrifuge is a machine being tested for the separation of heavy isotopes of uranium that can be handled in gaseous form. Separation of uranium-235, the fissionable variety, from the uranium-238 with which it occurs naturally is an example.

Continuation of basic research under way at the University of Virginia is planned, as well as experimental operation of small groups of machines by Union Carbide Nuclear Corporation at Oak Ridge, Tenn.

• Science News Letter, 78:421 December 24, 1960

TECHNOLOGY

Telephone Cables Girdle World via Pacific in 1964

► BY LATE 1964 you should be able to telephone around the world by cable.

A proposed transpacific telephone system is intended to be the immediate next step in the "round-the-world" system after the completion of the new transatlantic cable (CANTAT) next year.

The annual report of the British Commonwealth Telecommunications Board reports how plans are being developed rapidly for the construction of this stage and a complete world system.

It is expected that the laying of this cable will be completed by 1964. The route will be Sydney-Auckland-Suva-Fanning Island-Hawaii (subject to agreement of U. S. authorities)-Vancouver.

The plan is one of the largest telecommunications projects ever undertaken. It will be over 8,000 nautical miles long, with more than 300 under-sea repeaters, and will have a capacity for at least 80 simultaneous telephone conversations. In places the cable and repeaters will have to be laid to depths of almost four miles.

The total cost of the complete "round-the-world" system, as estimated by the 1959 Sydney conference, is \$225 million. Of this, Britain has provisionally agreed to contribute 50%, the other half being shared among the other Commonwealth countries. The total estimated cost of the Pacific section is \$75 million.

• Science News Letter, 78:421 December 24, 1960

EDUCATION

Scrambled Textbooks Spur Learning Process

► **SCRAMBLED TEXTBOOKS** in which readers scurry from page 1 to page 33 and then back to page 8 in a logical sequence are being used to spur the learning process.

The pages of these textbooks, called TutorTexts, are numbered consecutively, but not read that way. Each page ends with multiple-choice questions; the reader picks an answer and turns to the page number indicated beside his selection. If his choice is correct, he is directed to another page where he will learn new material. If he has chosen wrong, his error is explained and he is sent back to try again.

The format of TutorTexts makes a game of learning, but it is based on sound psychological principles. Faced with regular tests of his knowledge, the student is prodded to do his best.

The originator of the scrambled textbook is Norman A. Crowder, director of the training systems department at Western Design and Electronics Division of U. S. Industries, Inc. The method is used in his book, *The Arithmetic of Computers*.

• Science News Letter, 78:424 December 24, 1960

METEOROLOGY

Table Mountain Will Be Site for Weather Center

► **TABLE MOUNTAIN**, near Boulder, Colo., has been selected as the headquarters site for the National Center for Atmospheric Research, the National Science Foundation and the University Corporation for Atmospheric Research announced. The National Center will engage in fundamental research on broad atmospheric problems and will coordinate a wide network of similar investigations throughout the country. Table Mountain was chosen because it is ideally situated for the study of hail, thunderstorms, tornadoes and similar phenomena.

• Science News Letter, 78:424 December 24, 1960

MEDICINE

Contraceptive Devices May Prevent Cancer

► **CONTRACEPTIVE DEVICES** may play a significant part in preventing cancer of the cervix, or neck of the uterus. And circumcision appears to account for the infrequency of cervical cancer among Jewish women.

The reason is that chemicals rather than physical irritation may be the basis of cervical cancer in women. The contraceptive devices, whether worn by men or women, provide a physical barrier that prevents passage of the chemicals.

Drs. Milton Terris of the Public Health Research Institute of the City of New York and Margaret C. Oalman, Tulane University School of Medicine, New Orleans, report these suggestions in the *Journal of the American Medical Association*, 174, 1847, 1960.

They report further experimental studies are needed to verify their findings, but that

their investigation supports previous assumptions that sexual intercourse is a major factor in the origin of cancer of the cervix. Previous studies have also shown that cervical cancer is rarely found in nuns.

In a study of 122 hospital patients with cancer of the cervix and an identical number of patients with other female diseases, the scientists found no association between the cancer and the number of pregnancies, the duration and frequency of douching, or douching with such coal tar derivatives as Lysol. There was some indication that cervical cancer was associated with syphilis.

The physicians report that significant associations were found between cancer of the cervix and early marriage, multiple marriages, extramarital relations, early sexual intercourse, frequency of intercourse and non-use of contraceptives.

The cancer-producing chemicals may be found in smegma, a secretion found in the external sex glands of both men and women.

• Science News Letter, 78:424 December 24, 1960

PHYSICS

Million-Dollar Grant for U. of Pa. Atom-Smasher

► **A MILLION-DOLLAR** atom smasher for use in low energy nuclear physics research will be installed at the University of Pennsylvania under a National Science Foundation grant.

The 12-million electron volt tandem ion accelerator will be used to investigate the properties of the atom's nucleus. It also will enable the University to extend its research program in the study of irradiation damage and of selective irradiation in the related areas of radiobiology and biophysics.

The new equipment will be made available for research by neighboring institutions. It will operate under Dr. William E. Stephens, professor of physics.

• Science News Letter, 78:424 December 24, 1960

METEOROLOGY

Automatic Weather Station Computer

► **AMOS IV**, a specialized digital computer, has been developed as a research tool to explore the possibilities of an automatic weather station. Built by the National Bureau of Standards in cooperation with the U. S. Weather Bureau, the computer is the latest version in the AMOS (Automatic Meteorological Observation Station) series.

The AMOS IV receives data from weather-sensing instruments, then processes and arranges the data for teletype transmission to a central forecasting station and to airport weather stations. It can continuously monitor new input data—such as temperature, wind speed and direction, atmosphere pressure, cloud height—while simultaneously processing data already entered and transmitting messages on command.

Earlier versions of AMOS required several complex units to handle input quantities. In AMOS IV there has been a considerable reduction in components and therefore in maintenance.

• Science News Letter, 78:424 December 24, 1960

IN SCIENCE

MEDICINE

Many Ulcer Patients Can Escape Surgery

► **SPOTTING** the difference between benign and malignant gastric ulcers can spare a large number of gastric ulcer patients from major surgery.

Dr. Gerald D. Dodd of Houston, Tex., reported to the Radiological Society of North America meeting in Cincinnati, Ohio, that a skilled combination of X-ray and gastroscopic examination provides the proper diagnosis. In the gastroscopic examination a special device passed down the esophagus into the stomach is used to allow the physician to see most of the stomach's interior.

Color photography, through special equipment recently developed for gastroscopes, is also helpful in differentiating benign and malignant gastric ulcers, Dr. Dodd said.

The widespread opinion that all gastric ulcers should be treated surgically is based primarily on doubt in the ability of examiner to differentiate between the benign and malignant ulcer, he said. This opinion also stems from the belief that deaths or illness following stomach operations are outweighed by the number of cured patients, he added.

The Houston specialist in radiology said that it was debatable whether a patient with benign disease will be better off with all or part of his stomach removed.

He urged clinical evaluation of the ulcer to separate the candidate for immediate surgery from one who could derive a beneficial and lasting response from medical, or non-surgical, therapy.

Dr. Robert S. Nelson, also of Houston, was co-author of the report.

• Science News Letter, 78:424 December 24, 1960

MEDICINE

Synthetic Skin Developed To Aid Severely Burned

► **A TEMPORARY**, synthetic skin may now be used to save the lives of severely burned patients.

Dr. William M. Chardack of the Buffalo, N. Y., Veterans Administration Hospital told the Veterans Administration Annual Medical Research Conference in Cincinnati, Ohio, that results of experiments with a synthetic skin made of polyvinyl sponge and silicone rubber were encouraging.

The material, rigid when dry but soft, pliable and elastic when wet, has protected laboratory animals for periods up to 104 days. As the graft "takes," the surgical sponge is permeated by tissue and firm adherence comes about in a few days.

Although it is not a permanent skin graft, the synthetic probably can serve as a substitute long enough for the patient to recover and have new skin grafted, step by step, to the burned areas.

• Science News Letter, 78:424 December 24, 1960

THE FIELDS

CONSERVATION

Key Largo Coral Reef Protection Approved

► **EMERGENCY REGULATIONS** to halt commercial exploitation of Key Largo Coral Reef Preserve have been approved by the Department of the Interior.

The Preserve is a natural coral reef 21 miles long and about four miles wide, lying on the continental shelf off the southern tip of Florida. Commercial interests were blasting, dredging and otherwise defacing the underwater scenic beauties of the area, Interior officials said. Under the approved regulations, such actions will be prohibited.

Scientific specimens may be collected only on permit and no weapons will be allowed in the area.

• Science News Letter, 78:425 December 24, 1960

MEDICINE

Close Relationship Seen In Inflammatory Diseases

► **CLOSE RELATIONSHIP** exists between several different kinds of inflammatory rheumatic disorders, Dr. Gerald P. Rodman of the University of Pittsburgh School of Medicine reported at the Hahnemann Medical College and Hospital symposium on inflammation and diseases of connective tissues in Philadelphia.

Dr. Rodman called especial attention to the relationship between rheumatoid arthritis and systemic lupus erythematosus, "although the exact nature of this relationship remains unclear."

Other related diseases he mentioned were progressive systemic sclerosis and dermatomyositis, an inflammation of the skin and underlying tissues and muscle. An unusual "state of the immune system" exists in many patients with these diseases, he said, but the exact role played by immunologic reactions remains to be determined.

• Science News Letter, 78:425 December 24, 1960

NUTRITION

Oceans Are Limited As Man's Food Source

► **MAN CANNOT RELY** on the oceans as an inexhaustible source of food for the future. Although fish from the oceans has been used as food since the dawn of man, new ways of harvesting the ocean must be discovered to feed the mushrooming world population.

These new sources will be quickly exhausted through man's own carelessness and lack of planning, Dr. Robert Cushman Murphy, American Museum of Natural History zoologist, reported to the American Geographical Society meeting in New York.

Natural resources once considered plentiful are scarce today. Forests that once mantled the United States countryside with green are gradually being removed. Oil and ore reserves are rapidly being depleted.

Careless use is also taking a toll of ocean life, Dr. Murphy said. Too many whales are still being slaughtered. New England fishermen who used to catch a large variety of fish now find their nets empty. However, this problem is being masked by the fast means of transportation that bring the same kind of fishes to our dinner plate from other parts of the globe.

Dr. Murphy said all countries must cooperate closely in order to obtain the most effective use of the ocean's food. He cited the recent International Geophysical Year and the future international investigation of the Indian Ocean as examples of international cooperation.

• Science News Letter, 78:425 December 24, 1960

ICHTHYOLOGY

Pacific Salmon Found Near Scotland

► **PACIFIC SALMON** transplanted by Russians to the Barents Sea have now been found as far south as Scotland.

These fish, which were unknown in the waters off the coast of Europe as recently as five years ago, are now being netted in many places along the coast of northern Europe. Several thousand Pacific salmon have already been caught on the Norwegian coast, and many catches have been reported in Iceland.

These salmon probably came originally from the cold rivers that empty into the Barents Sea in northern Russia, near the Finland border. Since 1956, Russian scientists have been transplanting large numbers of Pacific salmon eggs to their northern waters just above the Arctic Circle to see if the salmon could survive.

As many of 75,000 salmon have returned to these same rivers to spawn, Dr. W. M. Shearer of Freshwater Fisheries Laboratory in Perthshire and Dr. E. Trewavas of the British Museum (Natural History), London, report in *Nature*, 188:868, 1960.

• Science News Letter, 78:425 December 24, 1960

PUBLIC SAFETY

Vibration Signals Warn Motorists of Danger

► **A ONE-MILE STRIP** of county road that warns drivers of approaching danger is being tested north of Richmond, Calif.

The road has a rock and plastic "rumble strip" system placed ahead of danger spots. The strips send sound and vibration warnings through the frames of automobiles.

The Contra Costa County Public Works Department and the California Research Corporation are making the tests to see whether motorists will slow down when they hear and feel the signals. At one 90-degree turn in the road, an average of seven major accidents per year occurred before the strips were installed.

• Science News Letter, 78:425 December 24, 1960

MEDICINE

Germ-Free "Isolator" Reduces Infections

► **A GERM-FREE** plastic chamber, called "isolator," has proved effective in reducing the number of wound infections that occur in operations.

Surgeons from Walter Reed Army Medical Center have performed surgery on animals placed in the isolator in such a way that the wound and underlying tissues are completely sealed off from the surgical environment. Even the surgeon and the patient are isolated by this new method.

Long-sleeved plastic gloves enable the surgeon to reach into the isolator, which also contains both instruments and supplies.

The isolator may be sterilized with ethylene oxide or by steam under pressure, "depending upon the type of plastic used," the Walter Reed team reported to the Clinical Congress of the American College of Surgeons meeting in San Francisco.

Another feature of the chamber is that it is disposable.

The surgeon's incision is made through the flexible plastic, glued firmly to the skin. All germs are thereby excluded since only the wound and underlying tissues come into contact with the isolator's interior sterile environment.

Dr. Stanley M. Levenson, P. C. Trexler, Dr. Ole J. Malm, Dr. Richard E. Horowitz and Dr. William H. Moncrief of Walter Reed, who reported on the surgical technique, state that it is ready for trial on patients.

It will be particularly useful for the isolation of patients particularly susceptible to infections, such as patients exposed to serious whole body irradiation, and for patients who have serious infections.

• Science News Letter, 78:425 December 24, 1960

MEDICINE

Hypnosis Successful In Severe Asthma

► **HYPNOSIS** as a final resort saved the life of a 60-year-old man, Dr. A. H. C. Sinclair-Gieben of the University of Aberdeen, Scotland, reports in the *British Medical Journal*, Dec. 3, 1960.

Until hypnosis was tried, the patient appeared to be dying in status asthmaticus, a condition in which attacks are continuous and do not respond to treatment.

"In many respects this patient could not have been more unfavorable for the induction of hypnosis," Dr. Sinclair-Gieben reports. The patient was extremely anxious, gasping for breath and unable to relax, yet he proved to be easily hypnotized.

The physician says that in this case hypnosis was probably successful because the patient knew this was his last chance and was determined to take it.

Although it is widely believed that hypnosis fails when there is deep-seated anxiety, motivation plays a part in determining hypnotic susceptibility. In this case, Dr. Sinclair-Gieben said, motivation may have overcome all other unfavorable factors.

• Science News Letter, 78:425 December 24, 1960

ASTRONOMY

Venus Brilliant in Evenings

In January Venus will draw farthest to the east of the sun, shining brightly. Mars is in Gemini, but Mercury, Jupiter and Saturn cannot be seen, James Stokley reports.

► DURING JANUARY the planet Venus (behind the sun) on Jan. 5, while will draw farthest to the east of the sun, thereby remaining visible in the western sky long after the sun has set. It is so brilliant (magnitude minus 3.9 on the astronomical brightness scale) that it is very easy to locate. It appears long before any other planet or star.

The accompanying maps show the appearance of the skies at about 10 p.m., your own kind of standard time, at the beginning of January; 9:00 p.m. at the middle and 8:00 p.m. at the end. Thus, in the first part of January, Venus sets too early to gain a place on the maps; its approximate position in the western sky is shown for the end of January. Since it is moving rapidly, its place among the stars changes from day to day.

Another planet is also shown. This is Mars, standing high in the south in Gemini, the twins. Although it is only about a fifteenth as bright as Venus, it is still more brilliant than any star, except for Sirius, which is lower in the sky.

Sirius Brightest Star

Sirius is the brightest of the stars which, like the sun, shine with their own light. The planets, on the other hand, shine with reflected sunlight.

Above and to the right of Sirius, which is part of Canis Major, the great dog, we find the constellation of Orion, the warrior. Here you see three stars in a row—Orion's belt. Above them is Betelgeuse, and below Rigel, both stars of the first magnitude. Still higher and farther right is Taurus, the bull, with brilliant Aldebaran. And directly overhead stands Auriga, the charioteer, in which Capella is the brightest star.

From here, descending toward the east, we come to Gemini, the twins, with Castor and Pollux. The latter is of the first magnitude, the former of the second. And below Gemini stands Canis Minor, the lesser dog, with Procyon.

Moving toward the left, so that we are now on the map of the northern half of the sky, we come to Leo, the lion, which is now beginning to appear again in the evening sky. In it is the star Regulus. This appears somewhat fainter than normal because of its low altitude and the absorption of its light by the greater thickness of air that it has to penetrate. A similar—and even greater—reduction of light occurs with Deneb, in Cygnus, the swan, which stands close to the northwestern horizon.

The other planets that are also sometimes visible to the naked eye, Mercury, Jupiter and Saturn, are not visible in January because they are too nearly in line with the sun. Mercury is in superior con-

Jupiter comes into a similar position on the same day, a few hours earlier. So does Saturn, on Jan. 11. Thus, during all of January, these planets will be so close to the sun's direction that we will not be able to see them.

On Jan. 2 the earth is nearest the sun, or at perihelion, only 91,337,000 miles away. This is about three million miles closer than it will be in July, when the earth is at aphelion (farthest from the sun). For us in the Northern Hemisphere the sun is now low in the sky, even at noon. Its rays fall upon the ground at a very low angle. They are not as concentrated as in June and July, when the noonday sun climbs well overhead. That is why we now have cold weather, even though the sun is at its closest for the year.

With the beginning of a new year those of us who use the Gregorian calendar start writing 1961 when we put down a date. That is the number of the year A.D., Anno Domini, supposedly measured from the birth of Christ. Actually, however, Christ was born at least as early as 4 B.C., by our reckoning, and perhaps several years earlier than that.

With other calendars, in use in other parts of the world, people write other year numbers: 5721, 2621, or 1380. The first is the current year in the Jewish calendar,

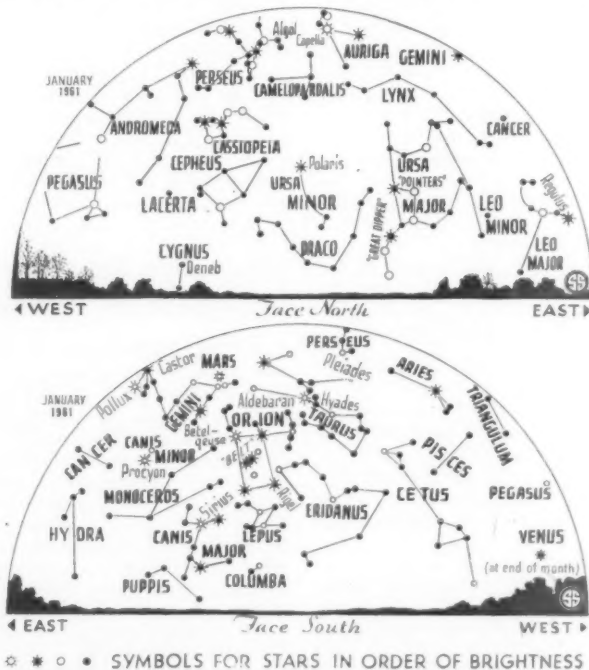
as measured from the supposed date of the creation. The new Jewish year, 5722, will begin Sept. 11. In Japan, the new year, 2621, begins on the same day as our new year. And in Mohammedan countries the year 1381, measured from the Hegira, Mohammed's flight from Mecca, begins June 15. The Hegira occurred in 622 A.D. The Mohammedan year is about ten days shorter than ours. That is why 1381 and 622 do not add up to 1961.

By other calendars—some no longer in use—we have quite a variety of year numbers. In the old Byzantine calendar it is now 7469; 7470 will start Sept. 14. By the one used in ancient Rome the year 2714 A.U.C. ("ab urbe condita"—from the founding of the city) starts on Jan. 14. If anyone still used the Babylonian calendar, which reckoned from Nabonassar, one of their early kings, he would celebrate the beginning of 2710 on May 3.

Year 2273 in Asia

In the era of the Seleucidae, following a calendar long used in western Asia, 2273 will commence on Sept. 14 or Oct. 14, depending on which of two reckonings is used. New Year's Day, by the Indian Saka calendar, will come March 22, with the start of 1883. And in the era of Diocletian 1678 will start on Sept. 11. This era began when Diocletian was proclaimed Roman Emperor in 284 A.D. It is still used by the Abyssinians and the Copts of Egypt.

But for us, it is the beginning of 1961, and, quite naturally, we look ahead to what the year may bring us. On the astronomical



★ ★ ★ SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

program, there will be four eclipses: two of the sun, two of the moon. First comes a total solar eclipse, visible along a belt crossing southern Europe and Russia, on Feb. 15. Over all of Europe, northern Africa and most of Asia, there will be a partial eclipse. Then will come a partial eclipse of the moon on March 2, partly visible, at least, over most of North America.

The second eclipse of the sun will come Aug. 11. This will be annular. That is, the moon will not completely hide the sun, but will leave visible a ring of the solar surface, around the dark lunar disc. This occurs even where the eclipse is at a maximum, in the South Atlantic, near Antarctica. The second lunar eclipse, also partial, will come on Aug. 26 and will be visible generally from North and South America.

When the moon passes in front of a star or planet, it is called an "occultation" rather than an eclipse. Several times Mercury is thus occulted and on one of these occasions, on March 14, it will be visible, with some difficulty, from North America. There will be a number of occultations of Aldebaran, in Taurus, and Regulus, in Leo. Several of these will be visible from this part of the world.

Mercury will be visible, low in the western evening sky, about June 1. Venus will continue to shine brightly in the west until the end of March; from the end of April through the rest of the year it will appear

in the eastern sky in the morning. Mars, so bright at the start of the year, will continue to be visible, but will become considerably fainter in the following months. Jupiter, during the spring, will be in the morning sky, but by fall it will be prominent in the evening. Saturn will follow a nearly similar program.

Celestial Time Table for January

Jan.	EST.	
1	Noon	Moon passes Mars
	6:06 p.m.	Full moon
2		Earth nearest sun, distance 91,337,000 miles
3	8:00 a.m.	Moon farthest, distance 252,500 miles
5	1:00 p.m.	Jupiter behind sun
	6:00 p.m.	Mercury behind sun
9	10:03 p.m.	Moon in last quarter
11	1:00 a.m.	Saturn behind sun
15	1:57 a.m.	Algol (variable star in Perseus) at minimum brightness
16	4:30 p.m.	New moon
	6:00 p.m.	Moon nearest, distance 221,600 miles
17	10:46 p.m.	Algol at minimum
19	Midnight	Moon passes Venus
20	7:35 p.m.	Algol at minimum
23	11:14 a.m.	Moon in first quarter
28	4:24 p.m.	Algol at minimum
28	2:00 a.m.	Moon passes Mars
29	2:00 a.m.	Venus farthest east of sun
30	8:00 a.m.	Moon farthest, distance 252,500 miles
31	1:47 p.m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

• Science News Letter, 78:426 December 24, 1960

PHYSIOLOGY

Man Can Adjust to Cold

► DEATH IS NOT a necessary result of very low body temperature. It is probable that man can adjust to cold as well as to heat.

Steven M. Horvath of The Lankenau Hospital, Philadelphia, told the American Society of Mechanical Engineers in New York that "shivering hairless man can get along pretty well in extreme cold."

Mr. Horvath said recovery from body temperatures as low as nine degrees centigrade, or 48 degrees Fahrenheit, have been recorded. Some animal experiments indicate that under certain conditions body temperatures can be lowered to zero degrees centigrade, or 32 degrees Fahrenheit, or even slightly lower with complete recovery

even though the heart has not been functioning for some minutes.

He said there is no such thing as a constant body temperature, since variations up to 10 degrees are found in the human body. The temperature that scientists are interested in controlling primarily is that of such deep central areas as in the heart, lungs and brain.

Arctic and Antarctic explorers have often suggested development of an acclimation process, he said, and there is some evidence that "certain local mechanisms" do improve with continued cold exposure. But it has not been easy to separate the influence of the use of clothing and other protective devices from the physiological factors.

• Science News Letter, 78:427 December 24, 1960

PHYSIOLOGY

Teen-Agers Are Heavier

► TODAY'S UNITED STATES teen-agers are taller and heavier than those of earlier generations, statisticians of the Metropolitan Life Insurance Company in New York have found.

They compared height-weight information for teen-agers applying for insurance between 1935 and 1953 with that from those insured between 1885 and 1900. Average height of boys 15 to 16 years old is 1.8 inches greater than in the earlier time. For boys at ages 17 to 19, the gain was 1.6 inches.

For girls, the corresponding increases in average height were six-tenths and four-tenths of an inch in the respective age groups.

The greater height and weight of the present generation of teen-agers reflects primarily better nutrition, advances in medicine and public health, and generally higher standards of living.

To some extent, however, the growth trends are due to the attainment of physical maturity at a somewhat younger age, on the average, than in earlier generations.

• Science News Letter, 78:427 December 24, 1960

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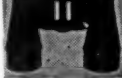
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ABNORMAL PSYCHOLOGY—Walter J. Coville, Timothy W. Costello and Fabian L. Rouke.—*Barnes & Noble*, 298 p., paper, \$1.75. Outline summary on types, causes and treatment of mental illness.

ADVANCES IN CATALYSIS AND RELATED SUBJECTS, Vol. XII—D. D. Eley, P. W. Selwood and Paul B. Weisz, Eds.—*Academic*, 324 p., \$11. Discusses surface bond, magnetic resonance, electron theory and molecular specificity in physical adsorption.

AGING: Some Social and Biological Aspects—Nathan W. Shock, Ed.—*Am. Assn. for the Advancement of Science*, 427 p., illus., \$8.50. Synopsis presented at Chicago meeting of the AAAS, December 1959.

ALL ABOUT BEGONIAS—Bernice Brilmayer, foreword by Clarence Hall—*Doubleday*, 223 p., illus., \$4.95. How to select, grow, propagate the many varieties of begonias.

THE AMERICAN CIVIL ENGINEER: Origins and Conflict—Daniel Hovey Calhoun—*Technology Press (Harvard Univ. Press)*, 295 p., map, \$5.50. Scholarly survey of the engineer's tasks and the profession's historical growth from the late 1700's through the 1840's.

AN ANNOTATED BIBLIOGRAPHY OF INFLUENZA, Vol. I, No. 1—Medical Documentation Service—*AIBS*, 20 p., \$2. To be published quarterly; references to articles on influenza and related subjects published in the United States and abroad.

APPARATUS DRAWINGS PROJECT (AAPT-AIP), Vol. I—Robert G. Marley, Ed.—*Plenum Press*, 30 drawings in cardboard case, \$40. Presents physics teachers and laboratory workers with complete data and drawings for apparatus developed in the physics laboratories of leading U. S. colleges and universities.

ARITHMETIC FOR THE MODERN AGE—Aaron Bakst—*Van Nostrand*, 341 p., \$4.95. Concise treatment designed for the busy adult who seeks proficiency for practical use.

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M. A. Vorontsova and L. D. Liosner, transl. from Russian—*Pergamon*, 489 p., illus., \$12. Russian specialists in regeneration research present processes of asexual reproduction, physiological and reparative regeneration in separate animal groups.

ASPECTS OF THE ORIGIN OF LIFE—M. Florin, Ed.—*Pergamon*, 199 p., illus., \$5. Articles of interest to the layman and scientist working in other fields, selected from Symposium on the Origin of Life on Earth, held in Moscow.

BIBLIOGRAPHY OF BOOKS FOR CHILDREN, 1960—*Assn. for Childhood Educ.*, 134 p., paper, \$1.50. Suggests quality books for ages four to twelve, listed by subjects, including science.

BIBLIOGRAPHY OF MEDICAL REVIEWS, Vol. 5, 1960—National Library of Medicine—*GPO*, 232 p., paper, \$1.25. Lists by subject and author 2,382 review articles selected from some 5,000 periodicals received during 1959.

THE BIOLOGICAL EFFECTS OF ATOMIC RADIATION: Summary Reports 1960—National Academy of Sciences—*Nat. Acad. of Sciences-Nat. Res. Council*, 90 p., paper, free upon request direct to publisher, 2101 Constitution Ave., Washington 25, D. C. Also available, 19-page Report to the Public.

CALCULUS WITH ANALYTIC GEOMETRY—Thurman S. Peterson—*Harper*, 586 p., \$7.50. Revised text of "Analytic Geometry and Calculus," provides material for three-semester introductory course.

CARDIOVASCULAR EFFECTS OF NICOTINE AND SMOKING—Carl J. Wiggers, Chmn.—*N. Y. Acad. of Sciences, Annals* Vol. 90, Art. 1, 344 p., illus., paper, \$4. Discusses research investigating the possible deleterious effect of smoking on the heart and blood vessels.

CAREERS AND OPPORTUNITIES IN SCIENCE: A Survey of All Fields—Philip Pollack, introd. by Harlow Shapley—*Dutton*, rev. ed., 194 p., illus., \$3.95. Describes the work of men and women engaged in scientific research, with practical information for young people.

CHEM STUDY NEWSLETTER, Vol. I, No. 1—Lloyd E. Malm, Ed.—*Chemical Education Material Study*, 4 p., quarterly, free upon request direct to publisher, Rm. 457 West Hall, Harvey Mudd College, Claremont, Calif. Describes progress made in a high school chemistry curriculum study, with Glenn T. Seaborg as chairman of Steering Committee.

CULTURE IN HISTORY: Essays in Honor of Paul Radin—Stanley Diamond, Ed.—*Columbia Univ. Press*, 1,014 p., illus., \$15. Anthropological essays by 52 distinguished scholars, with bibliography of writings by Paul Radin.

DAWN IN A DUCK BLIND: A Guide to the Calls of Waterfowl—Peter Paul Kellog and Arthur A. Allen—*Cornell University Records*, 33½ RPM record, \$5.95. Produced from recordings made for Cornell Library of Natural

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THE DOUBLE PLANET—Isaac Asimov—*Abelard Schuman*, 158 p., illus. by John Bradford, \$3. The story of how man has probed the secrets of earth and moon, with useful appendix of facts.

EDUCATION DIRECTORY 1960-1961, Part 3: Higher Education—Theresa Birch Wilkins—*Office of Education (GPO)*, 209 p., paper, 75¢. Lists U.S. institutions of higher education by type of program and by state.

ELEMENTS OF CALCULUS—Thurman S. Peterson—*Harper*, 2nd ed., 519 p., \$6.50. Includes new chapter on solid analytic geometry.

ELEMENTS OF MASER THEORY—Arthur A. Vuylsteke—*Van Nostrand*, 362 p., \$9.50. Basic guide to the physical theories fundamental in maser operation.

ELEPHANT BILL—J. H. Williams—*Viking*, 250 p., illus., paper, \$1.45. Reprint of elephant manager's story about the training of work elephants in Burma.

ENERGY IN THE AMERICAN ECONOMY, 1850-1975: An Economic Study of Its History and Prospects—Sam Schurr and Bruce Netschert with others—*Johns Hopkins Press* for Resources for the Future, 774 p., illus., \$12.50. Comprehensive study of energy's role, past and future, in the U.S. economy.

FLYING SAUCERS AND THE U.S. AIR FORCE—Lt. Colonel Lawrence J. Tacker—*Van Nostrand*, 164 p., illus., \$3.50. Documented story of findings and investigations conducted by the Air Force concerning unidentified flying objects.

THE FOUNDATIONS OF SCIENCE—Sheldon J. Lachman—*Vantage*, 2nd rev. ed., 121 p., \$2.95. Outlines fundamental axioms of science, operating conceptions of science, and scientific method.

THE GOLDEN BOOK OF CHEMISTRY EXPERIMENTS: How to Set Up a Home Laboratory, Over 200 Simple Experiments—Robert Brent—*Golden Press*, 112 p., illus., by Harry Lazarus, \$1.95. Picture-book style introduction to experimenting.

GOVERNANCE OF COLLEGES AND UNIVERSITIES—John J. Corson—*McGraw*, 209 p., \$5.50. Inquiry into the way U. S. colleges and universities are run and how their governing practices may have to be adapted to meet the future demands on higher education.

HAMMOND'S WORLD TRAVEL—Editorial Staff—*Hammond*, 256 p., 560 photographs, maps, \$7.50. Takes the armchair traveler to cities and historic sites of five continents.

HANDBOOK OF CHEMISTRY AND PHYSICS: A Ready-Reference Book of Chemical and Physical Data—Charles D. Hodgman, Robert C. Weast and Samuel M. Selby, Eds.—*Chemical Rubber Pub. Co.*, 42nd ed., 3,481 p., \$12. Current scientific data in concise form.

HANDBOOK OF PALEONTOLOGY FOR BEGINNERS AND AMATEURS, Part I: The Fossils—Winifred Goldring—*Paleontological Research Institute*, 394 p., illus., paper, \$3. Useful college text on fossils, republished.

HANDBOOK ON BIOLOGICAL CONTROL OF PLANT PESTS—Cynthia Westcott, Ed.—*Brooklyn Botanic Garden*, 97 p., illus., paper, \$1. About aphid enemies, microbial insecticides, insect eradication by sterilized males, with illustrated list of insect friends.

HUNTING THE DESERT WHALE: Personal Adventures in Baja California—Erle Stanley Gardner—*Morrow*, 208 p., photographs, \$6. About hunting the gray whale with the camera in its winter breeding ground, Scammon's Lagoon.

HURRICANES, TORNADOES AND BLIZZARDS—Kathryn Hitt—*Random House*, 82 p., illus. by Jean Zallinger, \$1.95. Easy-to-read science book for young child.

IDEAS, INERTIA AND ACHIEVEMENT—F. B. Turk—*Am. Soc. of Mechanical Engineers*, 183 p., \$5. U. S. and Western European chief executives, scientists and engineers offer a set of suggestions to overcome the apparent lag between original scientific discovery and engineering application in a free enterprise system.

IMPROVING SCIENCE AND MATHEMATICS PROGRAMS IN AMERICAN SCHOOLS: A Report—Joint Commission on the Education of Teachers of Science and Mathematics—*Am. Assn. for the Advancement of Science*, 41 p., paper, free upon request direct to publisher, 1515 Mass. Ave., Washington 5, D. C. Issued jointly with American Association of Colleges for Teacher Education.

INORGANIC SYNTHESIS, Vol. VI—Eugene G. Rochow, Ed.—*McGraw*, 272 p., \$7.75. Covers a wide variety of substances, from active metals to isotopically labeled acids.

AN INTRODUCTION TO HOMOLOGICAL ALGEBRA—D. G. Northcott—*Cambridge Univ. Press*, 282 p., \$8.

THE LIFE OF SCIENCE: Essays in the History of Civilization—George Sarton, introd. by Conway Zirkle—*Indiana Univ. Press*, 197 p., paper, \$1.50. Reprint of 1948 edition.

LIFE UNDER THE PHARAOHS—Leonard Cottrell—*Holt, Rinehart & Winston*, 255 p., photographs, \$5. Deals with the daily life, houses and craftsman of Ancient Egypt.

LINEAR CIRCUITS, Part 1: Time-Domain Analysis. Part 2: Frequency-Domain Analysis—Ronald E. Scott with Martin W. Essigman—*Addison-Wesley*, 510 p., 417 p., \$6.75 each. Presents the methods of linear circuits as a solid foundation of electrical engineering.

MAN, RACE AND DARWIN—Philip Mason, Ed.—*Oxford Univ. Press*, 151 p., \$2.90. Papers read at Joint Conference of the Royal Anthropological Institute and the Institute of Race Relations, London, 1959.

A MANUAL OF SPHERICAL AND PRACTICAL ASTRONOMY, Vol. I: Spherical Astronomy. Vol. II: Theory and Use of Astronomical Instruments—William Chauvenet—*Dover*, 708 p., 631 p., illus., paper, \$2.75 each. Unabridged reprint of fifth revised edition.

MENTAL DRUGS: Chemistry's Challenge to Psychotherapy—O. A. Battista—*Chilton Co.*, 155 p., \$3.95. A chemist's presentation of the role of drugs in the fight against mental illness.

MINORITY GROUP AND CLASS STATUS AS RELATED TO SOCIAL AND PERSONALITY FACTORS IN SCHOLASTIC ACHIEVEMENT—Martin Deutsch—*Soc. for Applied Anthropology*, 32 p., paper, \$1.50. Detailed study of educational experiences in an urban lower-class Negro school.

MORPHOLOGY, CLASSIFICATION AND LIFE HABITS OF THE PROCTOIDEA (BRACHIOPODA)—Helen Muir-Wood and G. Arthur Cooper—*Geological Soc. of Am.*, 447 p., 135 plates, \$16.75. Systematic descriptions of all genera, ranging from Lower Devonian to Upper Permian, a span of about 125 million years.

NEBRASKA SYMPOSIUM ON MOTIVATION, 1960—Marshall R. Jones, Ed.—*Univ. of Neb. Press*, 268 p., \$4.25; paper \$3.25. Papers and comments.

ON THERMONUCLEAR WAR—Herman Kahn—*Princeton Univ. Press*, 651 p., \$10. Discusses the deterrence and waging of thermonuclear "Central Wars" between the U.S. and U.S.S.R., comparing some of the alternatives and some of the implications in these choices.

AN OUTLINE IN CLASSICAL GENETICS—Bernard S. Strauss—*Saunders*, 188 p., illus., \$5. Gives an account of the chemical nature and behavior of the hereditary unit.

PALEOGENEOLOGIC MAPS—A. I. Levorsen—*Freeman*, 174 p., illus., \$6. Demonstrates how these maps are made and how they may be used by

geologists interested in the history of sedimentary rock sequences.

A PICTORIAL ARSENAL OF AMERICA'S COMBAT WEAPONS—Will Eisner, introd. by Maj. Gen. J. B. Medaris—*Sterling*, 128 p., 200 photographs, \$3.95. Brief reference to operational weapons of the U. S. Armed Forces.

THE PROBLEM OF ACUTE HYPOTHERMIA—P. M. Starkov, Ed., transl. from Russian by R. E. Hammond—*Pergamon*, 319 p., illus., \$12. Experimental results showing the state of the central nervous system, gas exchange, respiration and circulation in animals subjected to excessive cooling.

THE PSYCHOLOGY OF CHARACTER DEVELOPMENT—Robert F. Peck with Robert J. Havighurst—*Wiley*, 267 p., \$6.50. Deals with the development of moral character in a group of typical American children.

RIGHTS AND WRITERS: A Handbook of Literary and Entertainment Law—Harriet F. Pilpel and Theodor S. Zavin—*Dutton*, 384 p., \$7.50. Authoritative treatment of libel, privacy, copyright, protection of ideas, contracts and censorship.

SATELLITES IN OUTER SPACE—Isaac Asimov—*Random House*, 79 p., illus. by John Polgreen, \$1.95. Facts about man-made satellites for the beginning reader.

SCIENCE PONDS RELIGION—Harlow Shapley, Ed.—*Appleton*, 308 p., \$5. Eighteen essays by scientists, examining the function of a belief in matters spiritual in an age of science.

SCIENTIFIC WORDS: Their Structure and Meaning—W. E. Flood—*Duell*, 220 p., \$3.50. Dictionary lists alphabetically about 1,150 word-elements (roots, prefixes, suffixes) with numerous examples of scientific words and their meaning.

SOLID PROPELLANT ROCKET RESEARCH—Martin Summerfield, Ed.—*Academic*, 692 p., illus., \$6.50. Volume 1 of a series sponsored by the American Rocket Society.

THE STORY OF THE TRADE WINDS—Ruth Brindze—*Vanguard*, 68 p., illus. by Hilda Simon, \$3.50. Story about the discovery of these winds and their benefit to man.

THE STRUCTURE OF GLASS, Vol. 2—A. A. Lebedev and others, E. A. Porai-Koshits, Ed., transl. from Russian—*Consultants Bureau*, 480 p., illus., \$35. Proceedings of the Third All-Union Conference on the Glassy State, Leningrad, November 16-20, 1959. Published simultaneously in Russian by USSR Academy of Sciences.

TEACHING MACHINES AND PROGRAMMED LEARNING: A Source Book—A. A. Lumsdaine and Robert Glaser—*Nat. Educ. Assn.*, 736 p., illus., \$7.50. Comprehensive reference work on techniques and concepts of programmed individual instruction and automated teaching devices.

THERE STAND THE GIANTS: The Story of the Redwood Trees—Harriet E. Weaver—*Lane Bk. Co. (Lippincott)*, 70 p., illus., photographs, \$2.95. Introduces young readers to interesting facts about the stately trees of California.

THIS CROWDED WORLD—Frederick Osborn—*Public Affairs Committee*, Pamphlet No. 306, 28 p., illus., paper, 25¢ direct to publisher, 22 E. 38th St., New York 16, N. Y. Outlines the difficulties to be overcome before the world's population can be brought under control.

TROPICAL AFRICA, Vol. I: Land and Livelihood. Vol. II: Society and Polity—George H. T. Kimble—*Twentieth Century Fund*, 603 p., 506 p., photographs, map, \$15. Timely and comprehensive study of an area more than twice the area of the U. S., organized by topics such as population, food supply, industries, health and education.

UNDERSTANDING LIGHT: The Science of Visible and Invisible Rays—Beulah Tannenbaum and

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Myra Stillman—*Whitelsey House*, 143 p., illus. by G. Schröter, \$3. About measuring, bending, bouncing and separating light.

THE WONDERFUL WORLD OF TRANSPORTATION—Laurie Lee and David Lambert—*Garden City Bk.*, 93 p., illus., \$2.95. Shows youngsters man's many methods of transportation in different places and times.

• Science News Letter, 78:428 December 24, 1960

Do You Know

Congress voted \$100,900,000 for the 1961 budget of the National Institute of Mental Health, a 40% increase over the 1960 appropriation.

About 200,000 people die from strokes each year in the United States.

Meteorites probably strike the earth at the rate of 160 per year, including those which fall into the ocean.

Only three percent of land on the earth's surface is useful for food production.

• Science News Letter, 78:430 December 24, 1960

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NATIONAL GEOGRAPHIC MAGAZINES 1888-1960, and issues. Periodical Service, Box 465-SN., Wilmington, Delaware.

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MEDICINE

Relief for Bone Cancer

► RELIEF FOR PATIENTS with bone cancer through use of chemicals was reported by the Veterans Administration.

Two types of treatment were given to 19 patients at Hines, Ill., VA Hospital who had cancer of the prostate that had spread widely to bone.

Seven of eight who received injections of radioactive polymetaphosphate, a condensed form of phosphate, showed improvement and relief of pain.

Many of 11 patients with the same cancerous condition, who received a combination of the polymetaphosphate and the female hormone estrogen, were reported showing rapid, complete disappearance of bone pain, weight gain and minimal undesirable effects from the radiation.

Radioactive phosphate has been used for some time in treatment of malignant tumors spreading to bone, but the radio-

active polymetaphosphate seems to localize better in the growing bone around the cancerous areas than does the labeled phosphate.

The researchers said the new treatment apparently surrounds the bone cancer with a shell of radioactivity and tends to spare healthy tissue from radiation damage. Further follow-up of the combination estrogen-metaphosphate treatment is planned. The scientists suggested that metaphosphate be tried for other kinds of bone cancer.

They emphasized that the treatment is thought to be palliative only, since the cancer in some cases has become active again after a number of months.

Drs. Ervin Kaplan, I. Gordon Fels, John J. Imarisio and William S. Walsh, with Bruno R. Kotlowski and Joseph Greco, all of the Hines, Ill., VA Hospital, did the research.

• Science News Letter, 78:430 December 24, 1960

MEDICINE

Thyroid Cancer Increase

► THYROID CANCER is increasing among young children, apparently as a result of radiation treatments for other ailments around the head and neck, according to Dr. George Crile Jr., head of the department of surgery, Cleveland Clinic Foundation.

Dr. Crile said children as young as three years old have had thyroid operations following X-ray treatments for thymus conditions.

"We are not willing to say that the radiation actually caused the thyroid cancer," he said, "but we do associate the cause with radiation."

Dr. Crile said adequate surgery can be performed without sacrifice of important nerves and muscles of the neck. Nodules can be felt in routine examinations that should be made during office visits.

"These nodules should be removed in

young persons especially," he said. "A different type of thyroid cancer is found among older persons. This is highly malignant."

Dr. Crile said the Cleveland Clinic Foundation in most cases has been able to prevent recurrence of thyroid cancer following surgery and to maintain the endocrine balance of the body by feeding thyroid. The same type of pills are given that persons take who have deficient thyroid but no cancer.

"The incidence of recurrence of thyroid cancer is only one-seventh of what it was when our clinic began this treatment eight years ago," he said.

Dr. Crile was in Washington, D. C., to address a meeting of the St. George Society for Medical Students under sponsorship of the Medical Society of the District of Columbia and the American Cancer Society.

• Science News Letter, 78:430 December 24, 1960

MEDICINE

X-Rays in Leukemia

► X-RAYS of pregnant women do not increase the occurrence of leukemia in their children, a team of British scientists has found, contrary to the results of some United States studies.

A study of 39,166 children in Great Britain, whose mothers had had abdominal or pelvic radiation during pregnancy, showed no evidence that the X-rays increased the occurrence of the cancerous blood disease disproportionately.

Only nine of the children died of leukemia in a 13-year period studied, whereas the "expected" number was estimated to be 10.5.

Records of children born in eight hospitals, four in Edinburgh, Scotland, and four in London, were studied by W. M. Court Brown, Western General Hospital, Edinburgh, and by Dr. R. Doll and A. Bradford Hill, both of the London School of Hygiene and Tropical Medicine, with the cooperation of Drs. D. H. Cummac, Margaret S. King, Eric Samuel, and W. N. Thomson, all of Edinburgh, and R. E. Lawrence, F. Pygott, R. E. Steiner and E. Rohan Williams, all of London. Their report appears in the British Medical Journal, Nov. 26, 1960.

• Science News Letter, 78:430 December 24, 1960

ASTRONAUTICS

Need Law for Outer Space

► A TWO-YEAR STUDY by the American Bar Foundation reveals there is too much integration of military and non-military uses of outer space. One problem is how to find a workable formula to separate the military from non-military uses of space, the Foundation reported.

The problem is complicated by world tensions reflected in the East-West power struggle and concern for national security. The inability of the United Nations Ad Hoc Committee on Peaceful Uses of Outer Space to define "peaceful uses" is an illustration of the problem, underscored in the 205-page legal analysis prepared under a grant by the National Aeronautics and Space Administration.

The report is a comprehensive outline of the broad range of space activities; the related problems of regulation and control that make it necessary to determine "how far is up" or the air limits of national sovereignty; and the liability involved if a rocket or parts of it launched by one nation fall on the territory of another. The rocket debris that recently landed in Cuba illustrates the difficulties.

The U-2 incident is an example of the problems involved in the question of "how far is up." The aerial reconnaissance of the U-2 has been challenged as a violation of national sovereignty, but there was no objection to the two satellites orbited about

the same time. The satellites were TIROS, a forerunner of a reconnaissance satellite with photographic capability, and an early MIDAS, a warning satellite designed to respond to the heat from missile launchings.

Do the differences in altitude and in vehicles make the activity politically and legally acceptable to states whose territories are observed? What are the boundaries of outer space? Do any, in fact, exist? These questions are basic to any international agreement or law on space. However, the position of any altitude line drawn varies with virtually every legal opinion.

Nevertheless, it appears possible to regulate or extend the present limits of international agreement on the use of radio wavelengths for communication purposes. This may be done, the report suggests, by merely amending and adjusting present laws and regulations.

The use of space for weather forecasting ultimately may involve the problem of weather control, in which all nations have a vital interest. With advances in space technology and increasing space traffic will come the need for safety standards.

Manned space travel will involve such problems as the repossession of space craft and the repatriation of space personnel who may land in a foreign country.

• Science News Letter, 78:431 December 24, 1960

GENERAL SCIENCE

NATO Endorses Institute

► THE CREATION of an international institute of science and technology in Western Europe, proposed by Rep. Victor L. Anfuso (D-N.Y.), was endorsed unanimously by the North Atlantic Treaty Organization's Parliamentary Conference recently concluded in Paris.

The necessary final approval by the NATO Council is a certainty, Rep. Anfuso said.

The institute will provide free training and research opportunities for students from the North Atlantic countries and the underdeveloped nations of the world for peaceful exploration of outer space, oceanography, meteorology, communications and other areas of scientific discipline.

"Its establishment is mandatory upon the free world," he said, "especially now that the Soviets are offering a free education plus living and travel expenses to students all over the world to attend their so-called Friendship University. This offer is profoundly appealing, particularly to the youth in the underdeveloped areas of the world, and is extremely effective in promoting the Communist way of life."

The international institute under NATO will promote Western ideals of liberty and democracy by offering training in an atmosphere of freedom.

"It also will help dispel the idea that

NATO is strictly a military alliance," he said, "and will promote world peace."

War may be eliminated "by the eventual creation of a world of abundance," he said. "This pooling of resources for peaceful purposes may help create such a world."

Rep. Anfuso, a member of the United States Congressional delegation to the NATO Conference, headed by Vice President-elect Lyndon B. Johnson, credited Sen. Henry Jackson (D-Wash.) with originally suggesting such an institute. Sen. Jackson is a former chairman of the NATO Science and Technology Committee.

• Science News Letter, 78:431 December 24, 1960

TECHNOLOGY

Produce Fresh Water By Freezing Salt Water

► FRESH WATER for the exploding population of the earth can be produced from salt water by freezing with ordinary "cooking" gas at a cost of only 19 cents per 1,000 gallons for the power and chemicals.

George Karnofsky of the Blaw-Knox Company, Pittsburgh, Pa., reported these figures at a symposium on saline water conversion at the American Institute of

Chemical Engineers meeting in Washington, D. C.

Butane is used as a refrigerant and as a melting agent in the process. A pilot plant for further studies is now being built. Preliminary studies indicate that a plant with a ten-million-gallon per day capacity can be built for \$20,000,000.

The salt water is frozen and melted with normal butane or isobutane in a closed cycle, providing direct contact between the butane and the water in both freezing and melting steps.

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TECHNOLOGY

Weather Maps Bounced Off Meteor Trails

► WEATHER MAPS have been successfully transmitted over distances up to 900 miles by bouncing radio signals off meteor trails, Dr. Philip Newman of the Air Force Cambridge Research Laboratories, Cambridge, Mass., reported.

Dr. Newman, speaking at the University of Maryland, said that radio communication by meteor trails is one possibility of overcoming disturbances in the ionosphere, affecting radio communications.

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TECHNOLOGY

Remote-Controlled Robot Has TV "Eyes," Soft Touch

See Front Cover

► THE LATEST IN ROBOTS, the Mobot Mark II, has double-jointed "shoulders," "elbows" and "wrists" as well as soft-padded "hands" to do its tasks in places too dangerous to man, such as radioactive areas.

The robot, seen on the cover of this week's SCIENCE NEWS LETTER, also has camera "eyes" to transmit pictures to a human operator at a remote control console.

Mobot Mark II, built by Hughes Aircraft Company, Culver City, Cal., was exhibited and demonstrated at the Atom Fair in San Francisco.

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Questions

AERONAUTICS—What type seats do most military planes have today? p. 421.

PHYSICS—Is californium believed ever to have existed on earth naturally? p. 423.

PUBLIC HEALTH—How many water-sampling stations does the Public Health Service have? p. 419.

Photographs: Cover, Hughes Aircraft Company; p. 419, The North Carolina State Optometric Society; p. 421, ACF Industries, Incorporated; p. 422, University of Pittsburgh School of Medicine; p. 423, University of California, Berkeley; p. 432, Du Pont Company.

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 1071. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

✿ **FAUCET WATER HEATER** gives instant steaming hot water from a cold water faucet. The compact, portable 24-ounce electric unit screws on to the faucet for a leak-proof connection that provides an electrical ground; thermostat control prevents over-heating. The heater is useful for cottages, camps, trailers, and many other places.

• Science News Letter, 78:432 December 24, 1960

✿ **AUTO ASH TRAY**, jet-powered, sucks cigarette butts into an airtight container where they smother instantly. Made of anodized aluminum in gold and black or silver and black, it can be installed in minutes to extend or recess from automobile dash.

• Science News Letter, 78:432 December 24, 1960

✿ **HAIR CUTTER** for "do-it-yourself" professional results requires no special skill and is safe and easy to use. Patented precision mechanism automatically positions and operates cutting blade between unbreakable nylon rollers. The cutter is non-electrical and can be used anywhere.

• Science News Letter, 78:432 December 24, 1960

✿ **AIR-CONDITIONED RUBBER BOOTS**, shown in the photograph, have a special kick-off spur on the heel for easy removal of muddy or wet boots without soiling hands. "Air-conditioning" in the



17-inch-high boots is provided by a patented design which produces a bellows-like action with each step. The tops, fastened by a single button, are tight enough to keep out snow.

• Science News Letter, 78:432 December 24, 1960

✿ **HEAT-GENERATING PELLETS** thaw ice-packed gutters and downspouts up to

30 times faster than rock salt and can be used on ice or snow-covered driveways, steps and walks. They leave no residue to damage floors or carpets when tracked inside. Available in 10-pound packages and larger sizes.

• Science News Letter, 78:432 December 24, 1960

✿ **FLAME-RESISTANT FLOCKING ADHESIVE** for decorating toys, displays or Christmas trees may be applied by brush or spray and can be colored to match decorated object. The white water-based adhesive will adhere to any surface. The coated object can then be dipped or sprinkled with decorative materials.

• Science News Letter, 78:432 December 24, 1960

✿ **ADJUSTABLE SHORTENING MEASURE** of rigid plastic adjusts from one tablespoon to half a cup. Plastic-bagged, the measure comes in yellow and turquoise combination with illustrated printed instructions on outside of easy-to-use, easy-to-clean unit.

• Science News Letter, 78:432 December 24, 1960

✿ **FRUIT-TREE HEDGER-PRUNER** is tractor-drawn with a cutting mechanism similar to that of electric hedge clippers. It can be operated at all heights and positions, requires little power, costs less than existing pruning equipment and is a time-saver.

• Science News Letter, 78:432 December 24, 1960



Nature Ramblings



► **THE USE OF HOLLY** to celebrate Christmastime is older than Christmas itself. The Teutons and Celts of northern Europe gathered the evergreen holly late in December for pagan festivals observing the coming of longer days and the sun's apparent northward turning. Any plant that could stay green in winter must be favored by the supernatural powers, they reasoned.

Most Americans are acquainted with English holly, *Ilex aquifolium* L., and American holly, *Ilex opaca*. The English holly, particularly sought for its bright red berries and shiny, scoop-edged leaves, also is known as Oregon holly, because it is commercially cultivated in that state. In florist shops, it is four or five times as expensive as American holly, which grows wild and has dull green leaves.

So popular are these species that 200 to 300 horticultural varieties of English holly, and about an equal number for American holly, are now available for holiday decorations.

Holly



Throughout the world, 275 to 300 species of holly can be found. Almost all have paired, opposite leaves and one sex per plant. The opposite sexual parts may be present, but usually they are undeveloped.

Among the 22 holly species native to the U. S., most are east of the Mississippi. Not all are evergreen. Native deciduous hollies include swamp holly, large leaved holly, winterberry, smooth winterberry and mountain holly.

Holly flowers, distinguished by delicate

joining of the petal bases, usually are white, but some Chinese species with orange and brownish flowers have been reported.

Holly berries may be red, white, scarlet-orange, or in certain variations, yellow. The inkberry holly usually has black fruits, but a white-berried inkberry has been found in Florida, and a red-berried inkberry appeared in South Carolina.

The leaves of certain hollies can be cured and brewed into an acceptable tea. The favorite, Cassina or Youpon holly, is quite safe in spite of its Latinized name, *Ilex vomitoria*, which is taken from stories of Southern Indians who used the plant in a strong ceremonial brew that acted as a powerful emetic.

Like Cassina, the inkberry holly has leaves that contain an appreciable amount of caffeine. American holly, on the other hand, was the most common substitute for tea during the Civil War but contains no caffeine.

—GLORIA BALL

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